

susception, proved fatal. He died on the afternoon of November 3, at the comparatively early age of fifty-eight, leaving a widow, two sons, and two daughters to mourn his loss.

Trained from childhood in the tenets of the Wesleyan faith, Mr. Watson was, up to the time of his decease, an active member, and loyal supporter of the United Methodist Free Church; but he was ever a man of broad and liberal views, and in his wealthier days gave much, in a quiet way, to various charitable objects.

As an employer of labour he was much respected by all his men, and as a member of various local boards of health and of education he was at all times courteous and useful.

He was elected a Fellow of this Society on November 13, 1857.

THOMAS WILLIAM WEBB was born on the 14th day of December, 1807. He was the only son of a clergyman, the Rev. John Webb, rector of Tretire cum Michaelchurch, in the county of Hereford, a living in the gift of Guy's Hospital, which he held with the Vicarage of St. John's, Cardiff. The Rev. John Webb was a good classical and antiquarian scholar; the late Sir Henry Ellis described him as an eminent authority on Norman French, and he was frequently called upon to give evidence in Courts of Law with respect to the interpretation of early documents, but the father of the future astronomer was more particularly devoted to researches respecting the history of the West of England during the period of the Civil War. He had inherited a large collection of MS. matter referring to the Cromwellian period from Baron Pengelly, a connection of the Cromwells, in whose house Richard Cromwell, sometime Lord Protector of England, died. During the greater part of a long life the Rev. John Webb was occupied in preparing a "History of Herefordshire during the Civil War"—a work which, though he lived to the age of ninety-three, he never finished, but his son, Thomas William Webb, with filial devotion, completed and published it after his death. In the preface the son speaks of the long years of thoughtful study which his father had given to the work, and of the dread of inaccuracy or precipitation which prevented its earlier publication. This careful and conscientious spirit was fully inherited by the son, and is a decided feature of his astronomical writings. Although the father did not finish his great work on the "History of Herefordshire," he completed several memoirs for the Society of Antiquaries, and edited more than one volume for the Camden Society, though one of these, "The Military Memoirs of Colonel John Birch," a Cromwellian leader, was left only partly finished, and was completed by his son.

Thomas William Webb's mother died when he was still a child, and his father devoted himself to the boy's education. He was a painstaking, carefully precise boy, preternaturally old and studious, as might have been expected from the child com-

panion of such a father, surrounded by books and MSS. The boy showed some taste for experimenting, and delighted in books on electricity and physics—Natural Philosophy books, as they were called in those days—enjoying them more than a fairy tale. He did “not consider Euclid to be work,” and would no doubt have taken to mathematics, but his father did not encourage such proclivities, desiring to make his son a scholar; a term which was identified in his mind with Latin and Greek verse-making and certain refinements of Latin composition, at which the boy worked hard but did not make the progress that his father had hoped. In 1826 he was entered at Oxford and became a Fellow Commoner at Magdalen Hall. In 1829 he took his degree, taking a second class in Mathematical honours. In after years he would excuse himself to younger friends for his University life, saying that he had been very idle, spending most of his time in desultory reading in the libraries. But he was no doubt preparing himself in a satisfactory manner for his future life, perhaps in a much more satisfactory manner than if he had strictly adhered to the University course. From his own account he does not seem to have had bad health, though he was not strong. In after years his strength was decidedly above the average, and he would tramp over the hills of his mountain parish as few clergymen of seventy can.

After leaving Oxford he was ordained a Curate on the 1st of August, 1829, in Hereford Cathedral, and was licensed to the curacy of Pencoyd, where he worked two years, and was not ordained to Priest's orders till the 7th of August, 1831, when he became Minor Canon and Precentor of Gloucester Cathedral. After some ten years' work in Gloucester he returned to Tretire and worked as curate to his father for nearly twenty years. In 1843 he married Henrietta Montague, daughter of Mr. Arthur Wyatt, of Troy House, Monmouth. The marriage took place on the 16th of May at Michel Troy church. In 1852 he was given the living of Hardwick, a large though thinly populated parish near to the Welsh border and Black Mountain district.

Here he wrote “Celestial Objects for Common Telescopes,” a book which has made the name of the parish familiar to astronomers all over the world. It may probably be said, without exaggeration, that this book has done more to introduce the possessors of telescopes to the remarkable objects in the heavens, and to create observers, than any other book which has been written. It has no doubt exercised an important and very valuable influence on the method of describing observations. Mr. Webb was greatly attached to the Rev. W. R. Dawes, and would recommend others to take Mr. Dawes's method of describing his observations as their model. Both men were particularly careful and conscientious in their statements, judiciously choosing their language so as to avoid any slight exaggerations as to the accuracy of their estimates or any undue generalisations from isolated facts. Both men were careful to give credit to others, and frequently

summed up very concisely and happily the results of prior observations. In reading any astronomical description by either Mr. Dawes or Mr. Webb, the reader is impressed by the unpretending precision of their style, while he is made fully to appreciate the doubtfulness of the phenomena of which they themselves felt doubtful.

In addition to the "Celestial Objects," which went through four editions, being greatly improved and enlarged by diligent revision at each edition, Mr. Webb wrote largely for periodicals on astronomical subjects. His articles will be found in "Fraser's," "The People's Magazine," "The Intellectual Observer," "The Student," "The Popular Science Review," "The Argonaut," "The English Mechanic," "Nature," and "Knowledge."

His private correspondence with amateur astronomers was very large. He patiently and generously gave his time to advising them with regard to their instruments and the course of work they should undertake. Few things pleased him more than to help in stirring up the enthusiasm of an observer in some distant colony. There must be a large amount of his correspondence treasured up in all parts of the world. His letters were always written in a neat, small hand, which enabled him to put a great deal into the page; and they were frequently illustrated with charming little drawings and enlivened by the quaintest humour, which of its kind is as curious as De Morgan's. His modesty was striking and most unaffected. This seems to have impressed all his friends, as well as his courtesy and obliging kindness as a correspondent, which made him very widely valued and beloved.

Like his friend Mr. Dawes, Mr. Webb was a good draughtsman. His drawings illustrating his observations were made on a smaller scale than is commonly adopted by telescopic observers, as he thought that in making large-scale drawings the observer has a tendency either to fill in more detail than he has actually observed, or to give an appearance of clear definition to details which have been only traced with difficulty. In representing lunar objects, where the multiplicity of clearly traceable detail overpowers the observer, Mr. Webb usually confined himself to diagrams or mere outline maps. In drawing comets, however, where the difficulty lies in faithfully representing delicate differences of brightness, he adopted rather a larger scale than other observers. The plates of the great comet of 1861, given in vol. xxii. of the *Monthly Notices*, do not do justice to his original drawings. His observations of this comet were very striking.

On the evening of June 30, 1861, while standing with his wife in the garden of the Parsonage at Hardwick, he noticed some faint streamers diverging from the nucleus of the great comet then visible. At first he took them for faint narrow lines of cirrus cloud; but their direction pointing to the nucleus of the comet attracted his notice, and on giving closer attention to them he

found that they were slowly closing up like a fan, always pointing to the nucleus of the comet. The observation is described in vol. xxii. of the *Monthly Notices*, and seems to have been an actual observation of the Earth's passage through the tail of the comet. There were two other observers who were fortunate enough to notice the same phenomenon—one, Mr. Williams of Liverpool, and the other in the Antipodes.

In a volume entitled "The Industrial Progress of New South Wales," published by authority of the Colonial Government, is a paper by Mr. Tebbutt, in which he says that while observing in Australia, on the morning of July 1, 1861 (i.e. really in the afternoon before sunset of our June 30) he noticed the widening out of the branches of the tail of the comet then visible. He remarks that this observation is very interesting when taken in connection with the announcement made by Mr. Hind that it appeared probable that in the course of June 30, 1861, the Earth passed through the tail of the comet at a distance of perhaps two-thirds of its length from the nucleus.

Mr. Webb and Mr. Williams observed the closing up of the streamers of the tail while Mr. Tebbutt in Australia observed the opening out of the streamers a few hours before, as the Earth entered the tail.

On Sept. 7, 1884, Mrs. Webb died from apoplexy. Her husband was completely prostrated by the sudden blow, and his health gradually failed, till he died, eight months after, on May 19, 1885, at Hardwick, the parish to which he had been devoted for nearly thirty years. If he had lived to December, he would have completed his seventy-eighth year.

In 1882 he was appointed one of the Prebendaries of Hereford Cathedral, an office which only required a month's attendance during the year, and would have separated him but little from his beloved parish.

He was elected a Fellow of this Society 1852, Jan. 9.

A. C. R.

WILLIAM WRAY was born at Whitby, in Yorkshire, on December 6, 1829.

His father, who was a sea-captain, wished to take him to sea, but his mother objecting, he was articled to a solicitor. He had a great love for astronomy and optics, and amused himself by constructing some reflecting telescopes, but not being satisfied with these, he turned his attention to the refractor, and made numerous experiments with a view to dispensing with flint glass, which was expensive, and at that time difficult to procure of good quality. These experiments were not practically successful.

Not liking the legal profession, he came to London in the year 1850, and commenced the practice of an optician, devoting himself at first chiefly to the construction of microscope objectives, and was perhaps the first professional optician who used

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